

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of the Commission's Rules to)	WT Docket No. 04-435
Facilitate the Use of Cellular Telephones and)	
Other Wireless Devices Aboard Airborne)	
Aircraft)	

COMMENTS OF ERICSSON INC

Ericsson Inc (Ericsson) hereby submits its comments in response to the Federal Communications Commission's (FCC or Commission) *Notice of Proposed Rulemaking*, released February 15, 2005, seeking comments on whether it should replace or relax its ban on airborne usage of 800 MHz cellular handsets, and related issues.¹

I. Introduction and Summary.

Ericsson strongly supports the FCC's initiative to replace or relax its ban on airborne usage of 800 MHz cellular handsets and to facilitate customers' use of wireless handsets on airborne aircraft under appropriate circumstances. By eliminating unnecessary regulatory restrictions, the FCC will provide carriers greater flexibility to deploy services in response to evolving market demands. Ericsson appreciates that substantial progress has been made on key issues, including controlling potential cellular handset interference with cockpit electronics. If the Federal Aviation Administration (FAA) modifies its rules to permit airborne cellular handset usage, the FCC's regulations should not impede greater access to voice and broadband services in flight. Ericsson applauds the FCC's collaborative efforts to ensure that its rules and policies complement the rules and policies of the FAA and aircraft operators.

¹ See *Notice of Proposed Rulemaking, In the Matter of Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and Other Wireless Devices Aboard Airborne Aircraft*, WT Docket No. 04-435 (Feb. 15, 2005) (NPRM).

In these comments, Ericsson recommends that the FCC:

- Eliminate its current Part 22 prohibition on airborne use of 800 MHz cellular telephones;
- Consider modifications to its Part 24 (Personal Communications Services or PCS) and Part 27 (Wireless Communications Services or WCS) rules to provide an appropriate framework for airborne provision of PCS and WCS, consistent with technical and business considerations;
- Adopt rules when it removes the Part 22 prohibition to ensure that terrestrial-based Commercial Mobile Radio Service (CMRS) networks are protected from harmful interference;
- Allow carriers to respond to customers' needs without limitations on technologies used and not mandate the pico cell concept as the sole solution to controlling harmful interference; and
- Overall, ensure that changes to its rules do not negatively impact customers' use of existing handsets or terrestrial-based CMRS networks.

II. Background.

The FCC adopted its current Part 22 prohibition on airborne use of 800 MHz cellular telephones in 1991. This prohibition prevents airborne use of 800 MHz cellular telephones on both commercial and private aircraft.² With broad application, the rule bars airborne use of cellular phones that passengers or crewmembers may carry on board, as well as use of any permanently installed cellular equipment. The FCC adopted its ban to guard against potentially

² See 47 C.F.R. § 22.925.

harmful interference to terrestrial cellular networks. The FCC has not adopted similar rules in Parts 24 or 27 to restrict airborne use of PCS or WCS, however.

In its *NPRM*, the FCC tentatively concludes that it should modify its current blanket prohibition on airborne cellular use.³ The FCC finds that allowing customers to use wireless handsets during flight could potentially benefit homeland security, business users, and consumers by adding to future and existing air-ground communications options including broadband applications.⁴ The FCC believes that removing or modifying its ban will provide enhanced flexibility to service providers to meet increasing demand for access to mobile telephone and data services and encourage deployment of innovative and efficient communications technologies and applications.⁵ At the same time, the FCC recognizes that if it lifts the ban, it must also establish protections against harmful interference to terrestrial CMRS networks.⁶

III. Discussion.

A. *The FCC Should Not Limit its Interference Solution to Pico Technology.*

The FCC proposes to permit airborne use of cellular handsets as long as they operate under the control of an onboard “pico cell” that directs handsets to operate at a sufficiently low power setting that prevents interference with airborne or terrestrial systems.⁷ The FCC believes that the pico cell concept can address interference concerns because the pico cell would not use the cellular band to provide the air-ground link between the pico cell and the public switched telephone network or the Internet.⁸ According to the FCC, the development of pico cell

³ See *NPRM* at ¶ 10.

⁴ See *id.*

⁵ See *id.*

⁶ See *id.* at ¶ 12.

⁷ See *id.* at ¶ 16. For example, the lowest power setting in the IS-95 standard (CDMA) is -50 dBm.

⁸ See *id.* at ¶ 14.

architecture, in which pico cells communicate with and control consumer handsets using a particular digital format, is well under way.⁹ The FCC seeks comment on whether it should mandate that pico cell technology comply with a specific set of technologies so that a pico cell can control all handsets used onboard aircraft.¹⁰

Airlines are aware that some passengers leave their handsets on during flights now, despite existing restrictions. Certainly, multi-technology pico cells, or similar approaches could decrease the likelihood that activated cellular telephones would interfere with terrestrial systems. Ericsson agrees that the pico cell concept, in particular, offers several advantages. For example, it may prevent consumer handsets from transmitting at power levels that could interfere with avionic systems and help guard against consumer handset interference with ground-based operations or other interference with terrestrial systems, assuming that the pico cell can control the associated handset technology. Pico cells may also be configured flexibly to allow use of certain services at specific times, which may also help address concerns that customers' cell phone usage may be intrusive for other passengers.

However, the FCC need not mandate only a single, certain set of technologies to ensure that consumer handsets will not transmit in an unauthorized manner. The FCC should not require that pico cell technology be the sole and exclusive solution to controlling harmful interference. Rather, the FCC should allow market forces to respond to consumer demands more freely. In this way, handset technology and pico cells can benefit from innovation together.

⁹ See *id.* at ¶ 15.

¹⁰ See *id.*

B. The FCC Should Adopt Technical Rules for Safe Airborne Handset Use.

The FCC also asks whether it should adopt technical rules governing onboard operation of pico cells using 800 MHz cellular spectrum.¹¹ For example, it asks, if a pico cell failed while an aircraft was airborne, how should its rules address the risk that cellular telephones would begin to search for a terrestrial base station, transmitting at maximum power?¹²

The FCC's concern that handset transmissions on airplanes in flight can adversely affect existing ground-based CMRS network infrastructure as well as avionics systems is well placed. Pico cells can only address certain aspects of protection. The FCC should adopt rules that reduce the potential for interference. For example, ground-based systems are more "visible" at certain times, such as during ascent and descent of the aircraft. Limiting airborne cell phone usage only to the boarding and "cruise" portions of the flight could significantly reduce interference risks.

Further, airline operators could direct safe and appropriate usage of consumer handsets in the same manner as other safety precautions, such as fastening seatbelts, through a visual indicator onboard the aircraft. The airline could use such an indicator to signal when there is an announcement or as a "do not disturb" for other passengers during international or overnight flights. If it removes its prohibition, the FCC must adopt technical rules that prevent handsets from causing harmful interference to terrestrial-based CMRS systems, also taking into account the unique operational issues related to aircraft.

C. Technical Solutions to Interference Issues Are Developing.

The FCC asks for comment, generally, on the viability of pico cell technology and other potential technological advancements to mitigate interference caused by wireless handsets used

¹¹ See *id.* at ¶ 16.

¹² See *id.*

onboard aircraft.¹³ It also solicited other suggestions for increasing flexibility for cellular licensees, while avoiding interference to airborne and terrestrial systems.¹⁴ Specifically, it asked whether it should adjust its permissible out-of-band and spurious emission limits on cellular handsets to ensure that aircraft systems are not affected by unwanted emissions from cellular telephones.¹⁵

At this time, it is not possible to determine whether and, if so, by how much, the FCC should adjust its permissible out-of-band and spurious emission limits on cellular handsets because it lacks a full and complete understanding of the penetration loss and level of isolation onboard. Likely, aircraft will require RF shielding, although different aircraft may have different shielding characteristics. Defining RF shielding characteristics of every seat and every aircraft configuration will provide challenges, however. The FCC will be better equipped to address this issue once it reviews additional information from a study currently being performed by RTCA, Inc. (RTCA).

Harmful interference to terrestrial networks can be minimized through use of leaky feeder cables or directional, or “smart,” antennas. Also, limiting use of cellular or similar devices to cruise altitudes will help mitigate interference during periods where CMRS networks are most at risk.

D. Cellular Licensees Operating in Space Should Have Rights Secondary to Cellular Licensees Operating in Terrestrial Networks.

The FCC also seeks comment on the issue of who should have rights to operate on 800 MHz cellular spectrum in an airborne pico environment.¹⁶ The FCC proposes that cellular

¹³ See *id.*

¹⁴ See *id.*

¹⁵ See *id.*

¹⁶ See *id.* at 17.

licensees operate pico cell systems on their licensed frequencies.¹⁷ The FCC asks how licensing rights should be apportioned or shared among licensees, since pico cell operations would be airborne and transitory, rather than permanently located in a single licensee's terrestrial service area, and, in principle, would access a wide range of cellular frequencies.¹⁸

Ericsson recommends that, assuming terrestrial frequency licenses are limited to terrestrial use, spectrum above a certain altitude should be licensed on a "non-exclusive" basis and used on a secondary basis to the terrestrial network. While licensees in this band will not have interference protection rights of primary, exclusive-use licensees, licensing schemes impose on all licensees a mutual obligation to cooperate and avoid harmful interference to one another. If terrestrial licenses extend to space, users will have to coordinate spectrum use continuously as useable onboard frequency bands change, *e.g.*, when an aircraft passes from one MTA or BTA to another. Updating the frequency table under these circumstances would be very technically challenging.

The FCC asks whether any parties besides or in addition to cellular licensees have rights to airborne use of this spectrum, either under a secondary market arrangement or under a separate authorization.¹⁹ It suggests, for example, that an aircraft owner or other third party might be authorized to install and operate a pico cell.²⁰ It asks, if it adopted a third party approach, what interference protection obligations should such third parties have to terrestrial cellular licensees?²¹

If the FCC grants spectrum rights to third parties or third parties negotiate such rights through a secondary market arrangement, their rights must be secondary to those of terrestrial

¹⁷ *See id.*

¹⁸ *See id.*

¹⁹ *See id.* at 18.

²⁰ *See id.*

²¹ *See id.*

cellular systems. Third parties must be held specifically accountable to safeguard against harmful interference.

E. The FCC's Rules Should Address PCS and WCS Devices.

The FCC asks whether it should adopt airborne handset use rules that apply to Part 24 and Part 27 services as well. While the FCC's existing rules at Parts 24 and 27 do not limit PCS and WCS devices in airborne aircraft, the FAA's restrictions apply broadly to include these devices. Therefore, if the FAA modifies its rules to permit usage of all such wireless devices, the FCC might be caught unprepared if its rules do not appropriately govern airborne usage of PCS and WCS devices.²²

Ericsson recommends that the FCC adopt rules proactively to ensure that its regulatory scheme also covers airborne use of Part 24 and Part 27 devices. In this way, the FCC can afford flexibility to licensees, but also provide a useful framework for development of airborne applications in these bands, consistent with technical and business considerations. The FCC can best protect incumbent services in these bands by extending this regulatory framework to cover Part 24 and Part 27 devices as well.

F. Additional Studies are Needed to Address All Potential Interference Issues.

In a second series of questions, the FCC asks whether its prohibition on airborne cellular use may be replaced by an industry-developed standard that would guard against harmful interference through technical and operational limitations.²³ The FCC notes that cellular infrastructure has changed significantly since 1991, when it first adopted its ban on airborne cellular handset use, and that technical innovations may assist industry in resolving potential

²² See *id.*

²³ See *id.* at ¶ 23.

interference issues without the Commission-mandated ban on usage.²⁴ The FCC seeks comment on whether industry might develop a standard to protect against harmful interference through technical and operational limitations in lieu of the Commission's current prohibition.²⁵ The FCC proposes that it permit cellular licensees to provide airborne service, subject to conservative technical limitations such as that transmitter output power not exceed a specific prescribed level; that cellular operations be secondary to terrestrial systems; or that licensees take other steps necessary to minimize interference with terrestrial systems.²⁶

Ericsson agrees that conservative technical and operational limitations could be adopted to permit safe airborne handset operation. The FCC must ensure that its rules address all potential interference conditions and causes. However, for example, the FCC's standards must take into account the large base of existing handset equipment that remains in operation. Handsets can remain in circulation as long as networks exist to support them (*e.g.*, AMPS). Therefore, the FCC's technical limitations must be sufficiently broad to cover all technologies still in use, since any existing handset technology could be used during flight. Before adopting any new standards, the FCC must ensure that its new standards do not negatively impact existing equipment. The FCC should allow the market to develop while protecting existing licensees in the bands from interference.

Also, Ericsson agrees that pico cells or similar solutions could decrease the likelihood that cell phones will cause harmful interference. However, the FCC must understand the actual interference environment before it can adopt solutions, such as pico cell technology, to ensure that its standards will fully guard against harmful interference. In fact, there are a number of variables beyond a device's emissions that make interference hard to analyze:

²⁴ See *id.* at ¶ 22.

²⁵ See *id.*

²⁶ See *id.* at ¶¶ 23-26.

There are many variables beyond a device's emissions that make interference events hard to evaluate and interference effects difficult to recreate in a controlled environment. These include change in the strength or frequency of the intentional avionics signal, the location of the airplane, the atmospheric conditions, the possible interaction of signals from multiple sources inside and outside of the aircraft, and even the orientation of the portable device.²⁷

If the FCC adopts technical rules that limit harmful interference potential, it must first evaluate all factors that impact the interference environment.

V. Conclusion.

The FCC should modify its Part 22, 24, and 27 rules to provide carriers greater flexibility to deploy airborne wireless services in response to evolving market demands as well as the needs of homeland security, business users, and other consumers. Specifically, the FCC should:

- Eliminate its current Part 22 prohibition on use of 800 MHz cellular telephones while airborne;
- Modify its Part 24 (Personal Communications Services) and Part 27 (Wireless Commercial Services) rules to provide an appropriate framework for airborne provision of these services consistent with technical and business considerations;
- Adopt rules to protect terrestrial-based CMRS networks from harmful interference;
- Provide regulatory flexibility to allow carriers to respond to customers' needs without limiting technologies used; and
- Ensure that changes to its rules do not negatively impact existing customer handsets or terrestrial-based CMRS networks.

²⁷ *Wireless Cabin: All Issues Resolved?* Aviation Today, available at <http://www.aviationtoday.com/cgi/av/show_mag.cgi?pub=av&mon=0104&file=0104wireless_cabin.htm> (May 26, 2005).

The FCC should adopt an appropriate regulatory framework that will permit airborne use of wireless devices while also controlling against any potential interference to terrestrial networks. Moreover, service available to subscribers should not be limited just because some carriers lack roaming agreements or because only certain carriers provide service while airborne. Rather, any proposal adopted by the Commission should be technology neutral and not unfairly disadvantage certain carriers and their customers.

Respectfully submitted this 26th day of May, 2005.

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